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(56) Documents cited  
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(58) Field of search  
 B8P  
 Selected US specifications from IPC sub-class  
 B65D

(54) Boxes formed from blanks

(57) A collapsible box in the form of a tray (eg for transporting cauliflowers or the like) made from a single card blank, comprises a corner gusset (20) which includes a tongue (28) engageable with a complementary slot (32) formed in the base (10) of the box. The gusset may be formed about a crease line which is slightly inclined to a side wall (12), to facilitate the tongue 28 entering the slot (32).

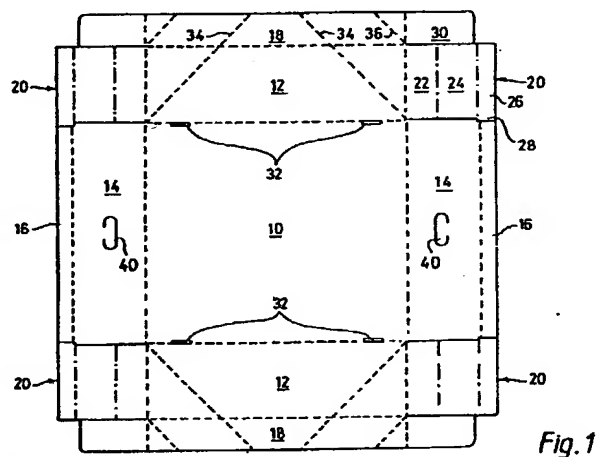


Fig. 1

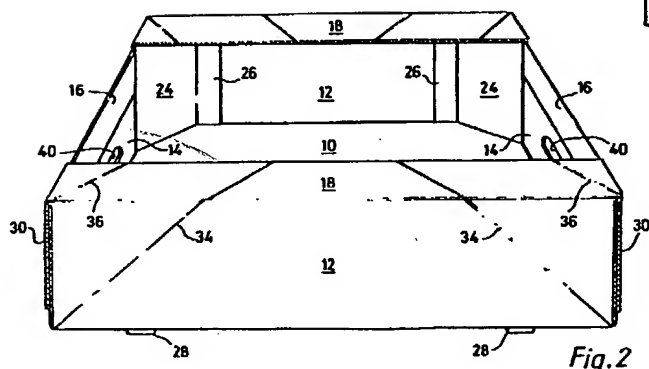
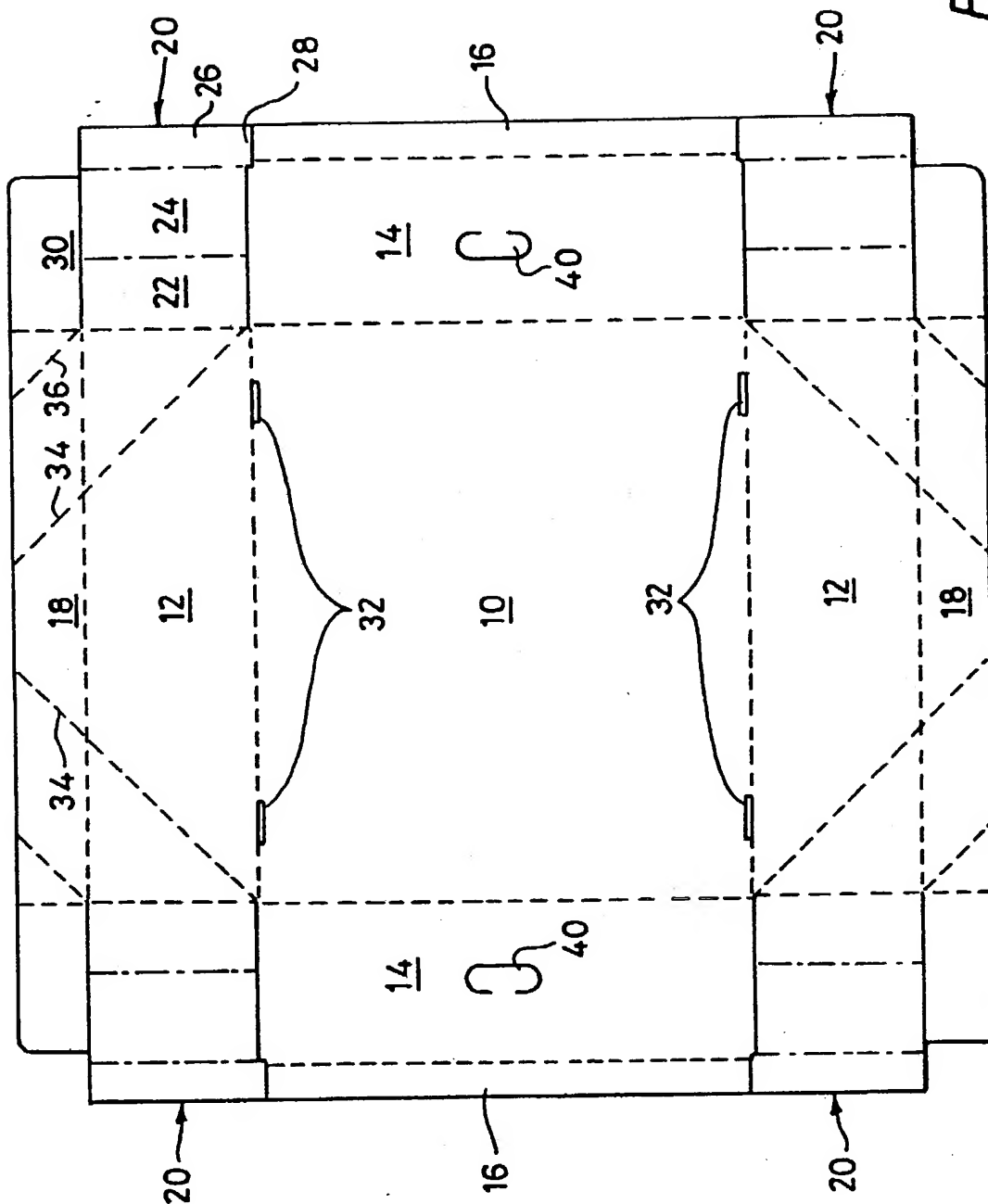


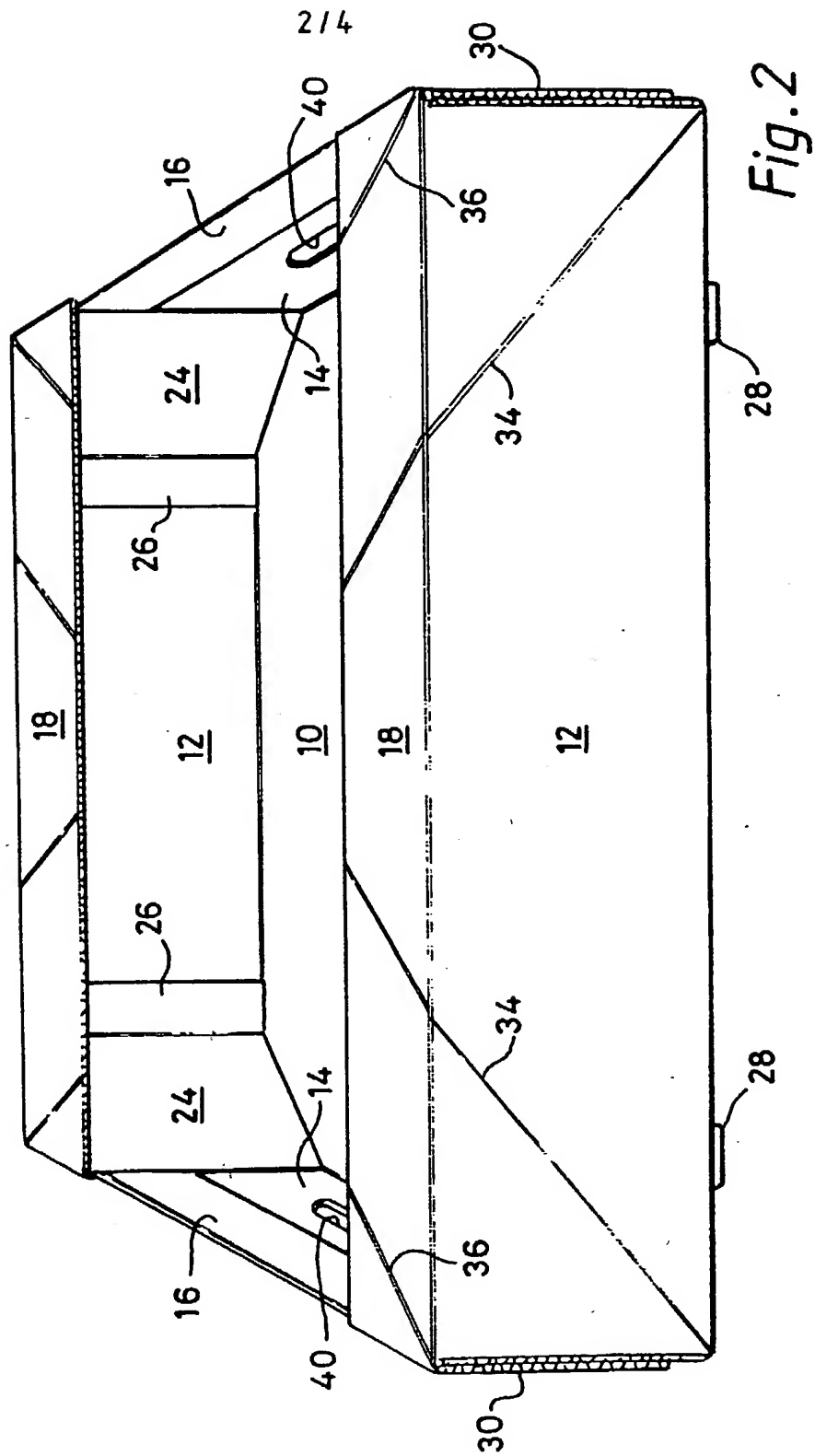
Fig. 2

The claims were filed later than the filing date with the period prescribed by Rule 25(1) of the Patents Rules 1982.

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Fig. 1

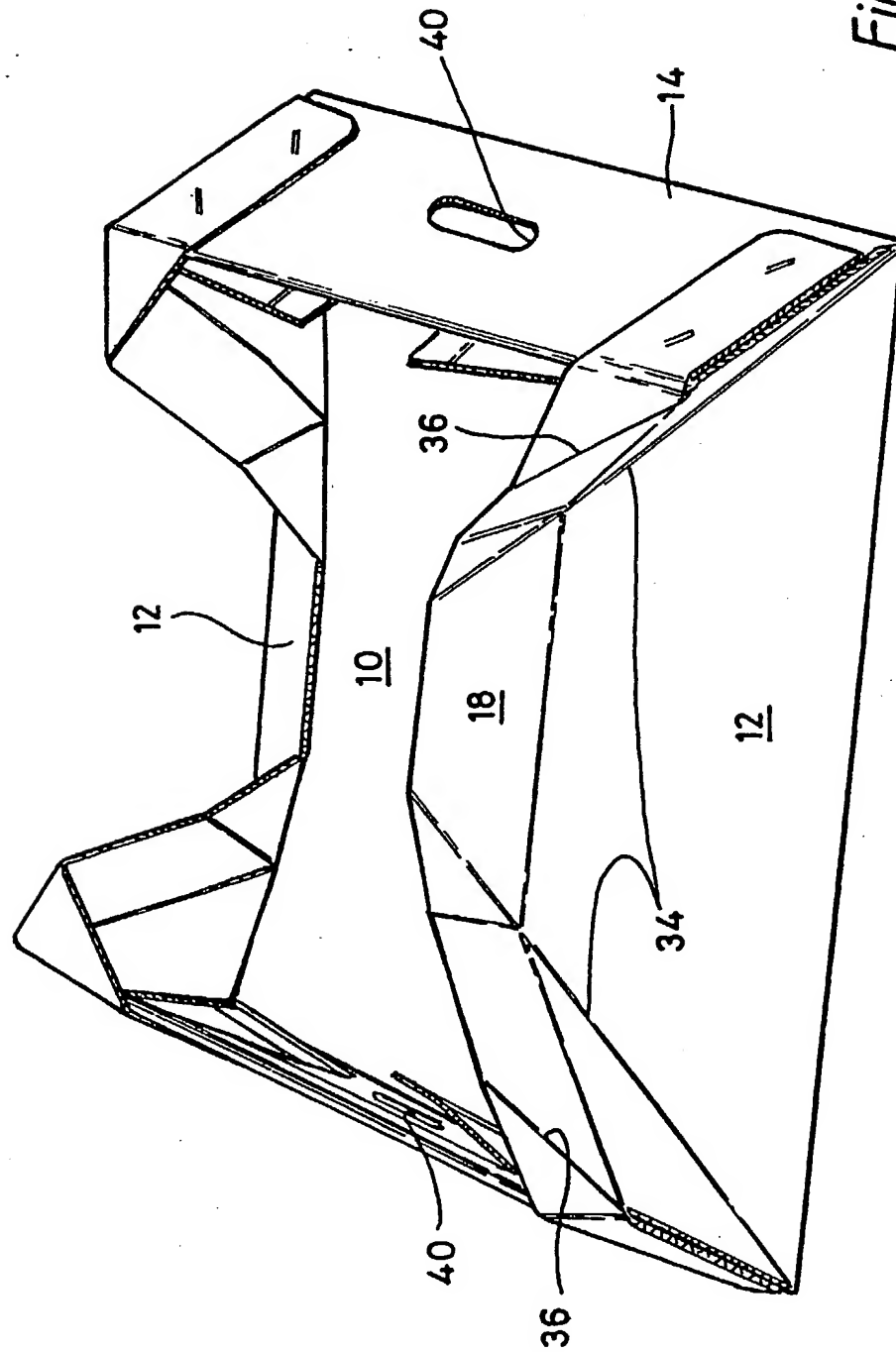






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Fig. 4



Title: CARD BOXESField of the invention

This invention relates to boxes made from card material or the like, and more particularly to a box which is in the form of an open ended tray.

Background to the invention

- 5 Tray like boxes made from corrugated board are widely used in the food and agricultural industries for containing, for example, vegetable produce such as cauliflowers and lettuces. With the heavier produce, such as cauliflowers, it is important that the boxes are constructed
- 10 sufficiently rigidly so that the tray like boxes can be stacked one on top of the other in multiple tiers without damage to the lower boxes.

- It is also a requirement for such boxes that they can be easily transported when empty, by being in a folded or
- 15 collapsed configuration. However, when they arrive at their destination where the produce is packed in the boxes, (such as the farmer who produces the cauliflowers), it is essential that the boxes can be easily erected to form a strong box.

- 20 It has been proposed to provide a box with strengthened corners by providing a corner reinforcing member resting against the corner and held in position by their own resilience or by the produce contained in the box. However, these corner reinforcements are uncertain in

operation, and such boxes do not lend themselves to being erected from a collapsed condition.

Summary of the invention

5 According to the present invention there is provided a box made from card or the like material and having a strengthening gusset formed across at least one corner, wherein the free end of the gusset has a tongue engageable with a complementary slot in the body of the box, so as to locate the gusset in position.

10 The box is preferably in the form of an open-ended tray, having a rectangular base and with a gusset at each corner.

15 Formed along the top of each side wall of the box there may be provided a stiffening ledge parallel to the base, the gusset being engageable between the base and the ledge so as to provide a support therebetween.

20 Preferably the sides of the ledge may extend over and be secured against the end walls of the box, as by stapling or stitching.

The tongue of the gusset may be formed on a downwardly facing edge, so as to engage in a slot in the base.

25 Preferably the gusset is formed about a hinge line against an end wall and which is slightly inclined relative to the side wall so as to facilitate the tongue being moved along the base and into said slots.

The box is preferably made of corrugated board, with the

corrugation flutes in the gusset extending perpendicular to the base.

Advantageously the box is formed with fold lines extending diagonally across its side walls, to enable the box to be folded flat for transportation purposes. Such a box is particularly well suited for containing vegetable produce such as cauliflowers, which may for example, be placed in the box in three rows of four, ie to contain a dozen cauliflowers.

Erection of the flat box merely requires the sides to be folded upright relative to the base, the ledges automatically springing into position parallel to the base. It is then only required to swivel the gussets around from against the end wall into the corners and to push the tongue into the corresponding slot in the base.

The invention also extends both to a flat blank from which such a box is made; and further to a collapsed box which is partly folded and secured together, such as by staples, and merely requires to be erected into such a box.

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#### Brief description of the drawings

An example of a box in accordance with the invention will now be described with reference to the accompanying drawings in which:-

25 Figure 1 shows a flat blank from which the box can be made;

Figure 2 is a perspective view of the erect box;



Figure 3 is a plan view of the collapsed box; and

Figure 4 is a perspective view of the box partly erected.

Description of embodiment

Referring first to the blank of Figure 1, this consists  
5 essentially of a rectangular base 10 with a pair of side  
walls 12 and a pair of end walls 14 formed at opposite  
sides of the base and defined by crease lines, shown chain  
dotted.

The blank is made from corrugated board, with the flutes  
10 of the corrugations extending parallel to the crease lines  
between the end walls and the base.

The end walls 14 terminate in reinforcing flaps 16, also  
defined by crease lines, and are adapted to be folded  
inwardly against the inside face of the end walls 14.

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The side walls 12 terminate in stiffening ledges 18,  
adapted to be folded about crease lines so as to be  
perpendicular to the side walls 12, ie parallel to the  
base 10 in the erect box.

20 Extending outwardly from the end of each side walls 12 are  
gussets, shown generally at 20. Since each corner of the  
blank is similar, only one gusset 20 at the top right-hand  
corner of Figure 1 has reference numerals for the sake of  
simplicity.

25 Each gusset 20 comprises a stiffener panel 22 adjoining  
the side wall 12 along a crease line, a corner panel 24  
adjoining the stiffener panel along a line which is cut

and creased (shown chain dotted), and a tab portion 26 adjoining the corner panel 24 also along a line which is cut and creased. The height of the panels 22 and 24 correspond to the height of the side wall 12, these panels being separated by a cut line from the end wall 14. However the gusset tab 26 is longer than the panels 22 and 24, comprising a tongue 28 separated from the reinforcing flap 16 of the end wall by a cut line.

As an indication of the height of the tongue 28, this may typically be 5 mm in height, where the width of the erect box between the side walls 12 is about 490 mm.

Extending from each side of the ledges 18 are corner flaps 30 separated by cut lines from the panels 22 and 24.

Towards the ends of the crease lines between the base and the side walls 12 are formed slots 32 adapted to receive the tongues 28.

Also formed across the side walls 12 and ledges 18 are diagonal crease lines 34, converging from the corners of the base 10 and forming an angle of  $45^\circ$  with the respective crease line between the base and the side wall 12. Further diagonal crease lines 36 are also formed at the ends of the ledges 18, and are parallel to the crease lines 34. The purpose of the crease lines 34 and 36 is to enable the partly formed box to be collapsed into a flat state, as will be apparent from the description below.

Referring now also to Figures 2 and 3, which show the box in the erect and collapsed conditions respectively, the box is formed from the blank as follows:-

The reinforcement flaps 16 are first folded through 180° against the inside of the end walls 14, and the entire gusset 20 is next formed perpendicular to the side walls 12. The side walls are next folded perpendicular to the base 10, and the end walls are similarly brought up perpendicular to the base, so as to lie against the as yet flat gusset 20. The corner flaps 30 of the ledges 18 (which may at this stage already be folded perpendicular to the side walls to bring them parallel to the base) are now brought over against the outside of the end walls 14. In this position the corners of the box can be secured together by stitching or applying staples 34 (see Figure 3).

It should be noted that the staples 34 at each corner pass through four layers of material, namely the corner flap 30, the double thickness of the end wall 14 and reinforcing flaps 16, and finally the stiffener panel 22 of the gusset 20.

From the erect position of Figure 2 the box can be collapsed into the position shown in Figure 3 by pressing in against the longer diagonal fold lines 34 and bringing up the shorter diagonal fold lines 36, and finally folding down the end walls 14.

When re-erecting the box for filling with produce, (eg, by the farmer produces the cauliflowers) it is merely necessary to reverse the previous procedure, by opening up the side walls 12 by straightening out the fold lines 34 and pushing down the shorter diagonal fold lines 36. Finally it is merely necessary to swivel the panel 24 and gusset tab 26 into the position shown in Figure 2, in which the gusset tab 26 lies against the side wall 12 and

the tongue 28 drops into the slot 32 in the base. In this position the panel 24 of the gusset is firmly in position and provides great strength and rigidity to the corners of the box between the base 10 and the ledges 18. By having the corrugations in the board running perpendicular to the base the gusset panel 24 provides further strength to the box.

It should be noted from Figure 3 that the panel 24 and tab 26 are slightly inclined relative to the end wall 14.

This may be arranged by having the crease line between the panel 22 and the side wall 12 inclined slightly away from the side wall 12, such that the tongue 28 is free from the base 10 while the gusset tab 26 is still folded against the end wall 14. In swinging about the cut and crease line between the panels 22 and 24 the tab 26 will gradually approach closer to the base 10 so that in the final position the tongue 28 can drop into the slot 32.

Finally, provision is made for lifting the box by forming an oval cut out 30 in each end wall 14, suitable for the fingers of a hand to be inserted during lifting.

CLAIMS

1. A box made from card or the like material and having a strengthening gusset formed across at least one corner, wherein the free end of the gusset has a tongue engageable with a complementary slot in the body of the box, so as to locate the gusset in position.

2. A box according to claim 1 which is in the form of an open-ended tray, having a rectangular base and with a gusset at each corner.

3. A box according to claim 1 or claim 2, in which there is formed along the top of each side wall a stiffening ledge parallel to the base, said gusset being engageable between the base and the ledge so as to provide a support therebetween.

4. A box according to claim 3 in which the sides of the ledge extend over and are secured against the end walls of the box, as by stapling or stitching.

5. A box according to any one preceding claim in which said tongue of the gusset is formed on a downwardly facing edge, so as to engage in said slot in the base.

6. A box according to any one preceding claim in which the gusset is formed about a hinge line against an end wall, the hinge line being slightly inclined relative to a side wall so as to facilitate the tongue being moved along the base and into said slot.

7. A box according to any one preceding claim in which the box is made of corrugated board, with the corrugation flutes in the gusset extending perpendicular to the base.
8. A box according to any one preceding claim in which there are formed fold lines extending diagonally across side walls of the box, to enable it to be collapsed and folded flat for transportation purposes.
9. A collapsed box according to claim 8 which is partly folded and secured together, such as by stapling.
10. A flat blank for forming a box according to any one preceding claim.
11. A box substantially as herein described with reference to, and as shown in the accompanying drawings.
12. A collapsed box substantially as herein described with reference to, and as shown in the accompanying drawing.
13. A flat blank for a box, substantially as herein described with reference to and as shown in the accompanying drawings.

**POOR  
QUALITY**

Amendments to the claims  
have been filed as follows

C100/V

CLAIMS

1. A box made from card or the like material and having a strengthening gusset formed across at least one corner, wherein the free end of the gusset has a tongue engageable with a complementary slot in the body of the box, so as to locate the gusset in position, there being formed along the top of each side wall a stiffening ledge parallel to the base, said gusset being engageable with the ledge so as to provide a support therefor, and there being formed fold lines extending diagonally across the side walls of the box, to enable the box to be collapsed and folded flat for transportation purposes.

2. A box according to claim 1 which is in the form of an open-ended tray, having a rectangular base and with a gusset at each corner.

3. A box according to claim 1 in which the sides of the ledge extend over and are secured against the end walls of the box, as by stapling or stitching.

4. A box according to any one preceding claim in which said tongue of the gusset is formed on a downwardly facing edge, so as to engage in said slot in the base.

5. A box according to any one preceding claim in which the gusset is formed about a hinge line against an end wall, the hinge line being slightly inclined relative to a side wall so as to facilitate the tongue being moved along the base and into said slot.

6. A box according to any one preceding claim in which the box is made of corrugated board, with the corrugation flutes in the gusset extending perpendicular to the base.
7. A collapsed box according to any one preceding claim which is partly folded and secured together, such as by stapling.
8. A flat blank for forming a box according to any one preceding claim.
9. A box substantially as herein described with reference to, and as shown in the accompanying drawings.
10. A collapsed box substantially as herein described with reference to, and as shown in the accompanying drawing.
11. A flat blank for a box, substantially as herein described with reference to and as shown in the accompanying drawings.